SR 5 Stanwood/Bryant Vicinity NB Weigh Station Mitigation Site

C5446

USACE NWP (23) 98-4-00030

Northwest Region

2005 MONITORING REPORT

Wetland Assessment and Monitoring Program

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SR 5 Stanwood/Bryant Vicinity NB Weigh Station (Stanwood Bryant)

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General Site Information	
USACE NWP (23) Number	98-4-00030
WSDOT Contract Number	C5446
Mitigation Location	SR 5 East of Exit 215, Snohomish County
Initial Monitoring Period	2001 – 2005
Year of Monitoring	5 of 5
Area of Project Impact	0.5 acres
Type of Mitigation	Wetland Enhancement/Creation
Area of Mitigation	0.71 acres

Summary of Monitoring Results and Management Activities (2005)

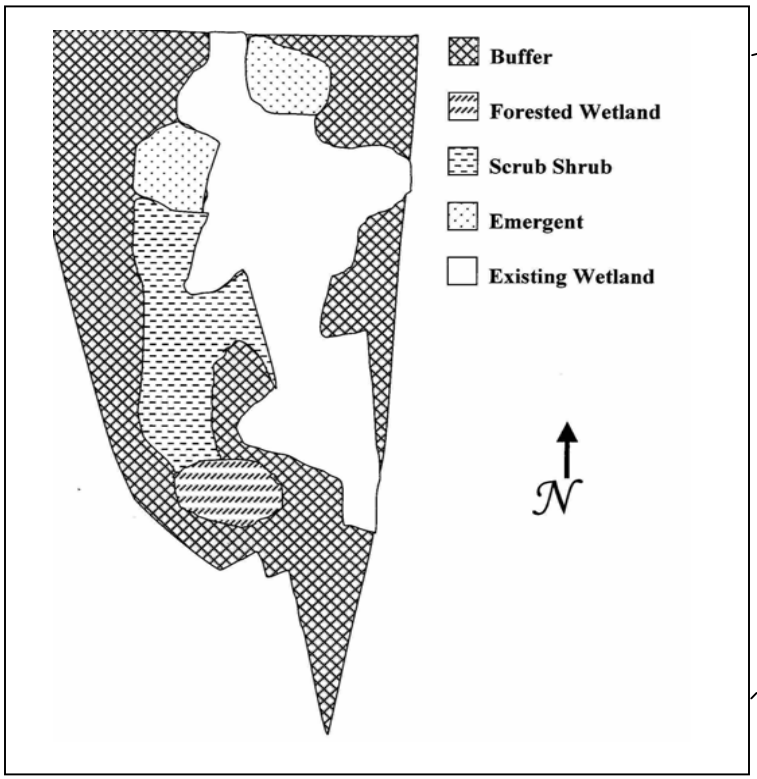
Performance Criterion	2005 Results	Management Activities
Success Standard (2005)		
Maintain a weed-free condition to ensure continued growth	Achieved	Weed Control

Report Introduction

This report summarizes final year (Year 5) monitoring activities at the SR 5 Stanwood Bryant mitigation site. Included is a description of the site, the success criteria, an explanation of how the site was monitored, and an evaluation of site success. Monitoring activities in 2005 included vegetation surveys and photo-documentation.

What is the I-5 Stanwood Bryant Mitigation Site?

This site is located just south of the Snohomish/King County line on the east side of Interstate 5. The site was established to provide compensation for wetland and wetland buffer impacts that occurred with the construction of a weigh station along the interstate. Grading activities were intended to enhance water quality and water storage functions at the Freedom Creek headwaters location. Enhancement of habitat value was also intended through the establishment of diverse native vegetation where *Pharlis arundinacea* (reed canarygrass) previously dominated.



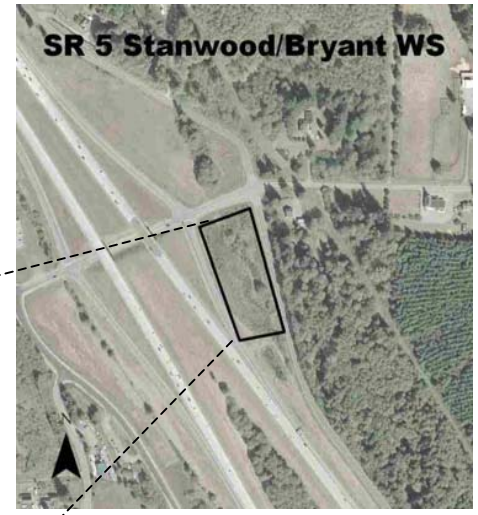


Figure 1 Site Sketch
The site has a combination of existing wetlands and created emergent, scrub-shrub, and forested wetlands. There is also a buffer that surrounds the site.

What are the success criteria for this site?

Success Standard
Maintaining a weed-free condition and irrigation as necessary to ensure continued growth shall be accomplished.

Appendix 1 provides the complete text of the success standards for this project, and Appendix 4 shows the planting plan (Ehinger and Tolon 1997).

How were the success standards measured?

Quantitative data were collected in 2005 to evaluate the final year (Year 5) success standard. A baseline was established along the east edge of the mitigation site (Figure 2). Twenty transects were randomly placed perpendicular to the baseline.[1] The point intercept method was used to estimate cover of non-native invasive species (Success Standard).

To provide additional site information, tree and shrub growth in the buffer and wetland plant communities were evaluated. The line intercept method was used to estimate woody cover.

For additional details on the methods, see Appendix 2 of this report or view the WSDOT Wetland Mitigation Site Monitoring Methods at: http://www.wsdot.wa.gov/environment/biology/docs/MethodsWhitePaper052004.pdf

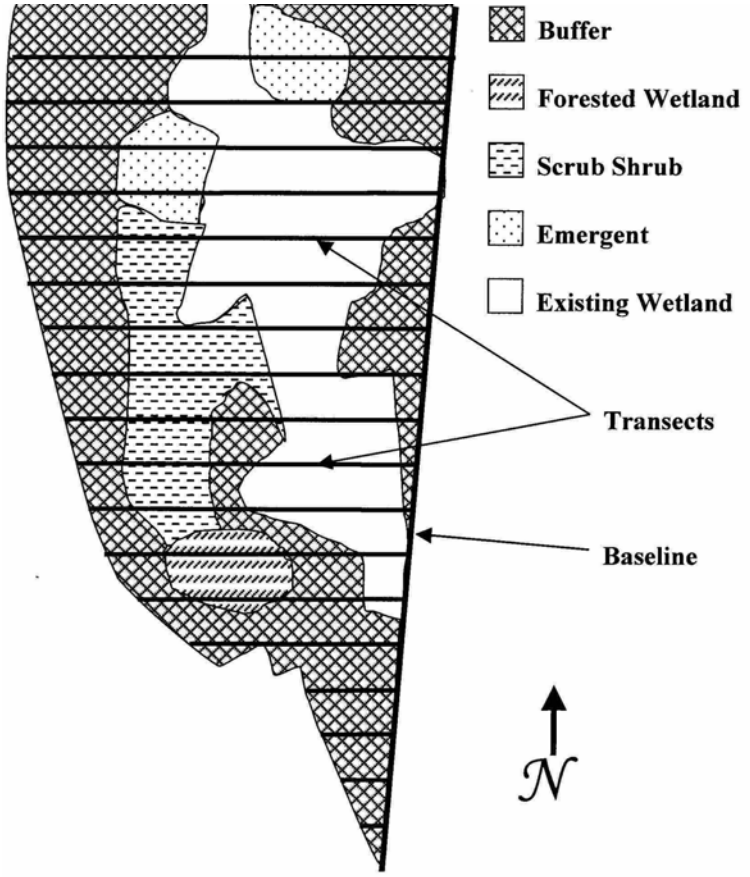


Figure 2 Site Sampling Design (2005)

[1] The existing wetland as labeled in Figure 1 was not sampled for non-native invasive species or woody cover.

Is the site a success?

Yes, the site is a success. In the final monitoring year, a diverse forested wetland is developing where previously there was a monotypic field of *Phalaris arundinacea* (reed canarygrass). Fourteen tree and shrub species comprise the woody plant community and invasive species cover is now relatively low due to successful weed control. Successful vegetation establishment in the wetland and buffer has enhanced bird, insect, rodent, reptile, and amphibian habitat on site as intended. Enlargement of the emergent areas in this headwaters wetland has provided increased water storage and also likely contributed water quality benefits to salmon-bearing Freedom Creek. Annual spring observations show the existing and created wetlands have adequate wetland hydrology well into the growing season. Plant and bird species lists are included in Appendix 3.

Results for Success Standard
(Maintain a weed-free condition to ensure continued growth):

Aerial cover provided by non-native invasive species in the planted areas (all zones except preserve) is estimated to be 18% ($CI_{80\%}$ = 14-21%). This is far lower than pre-existing conditions when the site was dominated by *P. arundinacea.* Persisting invasives do not appear to be affecting the growth of planted trees and shrubs.

Trees and shrubs are well established and range from one to four meters in height (Photo 1). The estimated aerial cover of native woody species is 56% ($CI_{80\%}$ = 46-66%). Volunteer *Populus balsamifera* (black cottonwood) and *Alnus rubra* (red alder) compliment the cover provided by the diverse mix of original plantings.

Photo 1

Woody cover in the scrub shrub zone (2005)

Appendix 1 – Success Standards

The following excerpt is from the *SR 5 Stanwood/Bryant Vicinity Weigh Station Conceptual Wetland Mitigation Plan* (Ehinger and Tolon 1997). The standards addressed this year are identified in **bold** font.

Standard of Success

During the first year plant establishment, planted species that are dead or unsatisfactory shall be replaced. **Maintaining a weed-free condition and irrigation as necessary to ensure continued growth shall be accomplished.**

Appendix 2 - Methods

To evaluate wetland and buffer plant communities, a 180-meter baseline was established along the east edge of the mitigation site. Twenty temporary sampling transects were placed perpendicular to the baseline using a systematic random sampling method.

Aerial cover of non-native invasive species was assessed using the point intercept method (Success Standard). Twenty 35-meter point-line sample units (70 points each unit) were randomly positioned along the sampling transects in all zones (except the preserve).

To provide additional information on plant community development, aerial cover of woody species was estimated using the line intercept method. Eighteen randomly positioned 35-meter line-segment sample units were placed along sampling transects in all zones (except the preserve).

Sample size analysis confirmed sufficient sampling had been completed based on site sampling objectives and the desired level of statistical confidence. The sample size equation shown here (right) was used to perform this analysis.

$$n = \frac{(z)^2 (s)^2}{(B)^2}$$

z = standard normal deviate
s = sample standard deviation
B = precision level
n = unadjusted sample size

For additional details on the methods described above view WSDOT Wetland Mitigation Site Monitoring Methods at:
http://www.wsdot.wa.gov/environment/biology/docs/MethodsWhitePaper052004.pdf

Appendix 3 - Data Tables

Table 1 Woody Species Observed On Site in 2005

Scientific Name	Common Name	Wetland Indicator Status
Populus balsamifera	black cottonwood	FAC
Salix sitchensis	Sitka willow	FACW
Salix lucida	Pacific willow	FACW+
Alnus rubra	red alder	FAC
Spiraea douglasii	hardhack	FACW
Frangula purshiana	cascara	FAC-
Symphoricarpos albus	snowberry	FACU
Lonicera involucrata	twinberry	FAC+
Sambucus racemosa	red elderberry	FACU
Thuja plicata	western red cedar	FAC
Picea sitchensis	Sitka spruce	FAC
Cornus sericea	redosier dogwood	FACW
Ribes sanguineum	red flower currant	NL
Physocarpus capitatus	Pacific ninebark	FACW-

Appendix 3 - Data Tables (continued)

Table 2 Herbaceous Species Observed On Site in 2005

Scientific Name	Common Name	Wetland Indicator Status
Argentina anserina	silverweed cinquefoil	OBL
Lotus corniculatus	birdsfoot trefoil	FAC
Holcus lanatus	common velvetgrass	FAC
Anthoxanthum odoratum	sweet vernalgrass	FACU
Agrostis capillaris	colonial bentgrass	FAC
Agrostis gigantea	Redtop	FAC
Juncus effusus	soft rush	FACW
Carex obnupta	slough sedge	OBL
Carex stipata	owlfruit sedge	OBL
Myosotis laxa	bay forget-me-not	OBL
Trifolium pratense	red clover	FACU
Typha latifolia	broadleaf cattail	OBL
Parentucellia viscosa	yellow glandweed	FAC-
Prunella vulgaris	common selfheal	FACU+
Centaurium erythraea	European centaury	FAC
Scirpus microcarpus	panicled bulrush	OBL
Parentucellia viscosa	yellow glandweed	FAC-

Appendix 3 - Data Tables (continued)

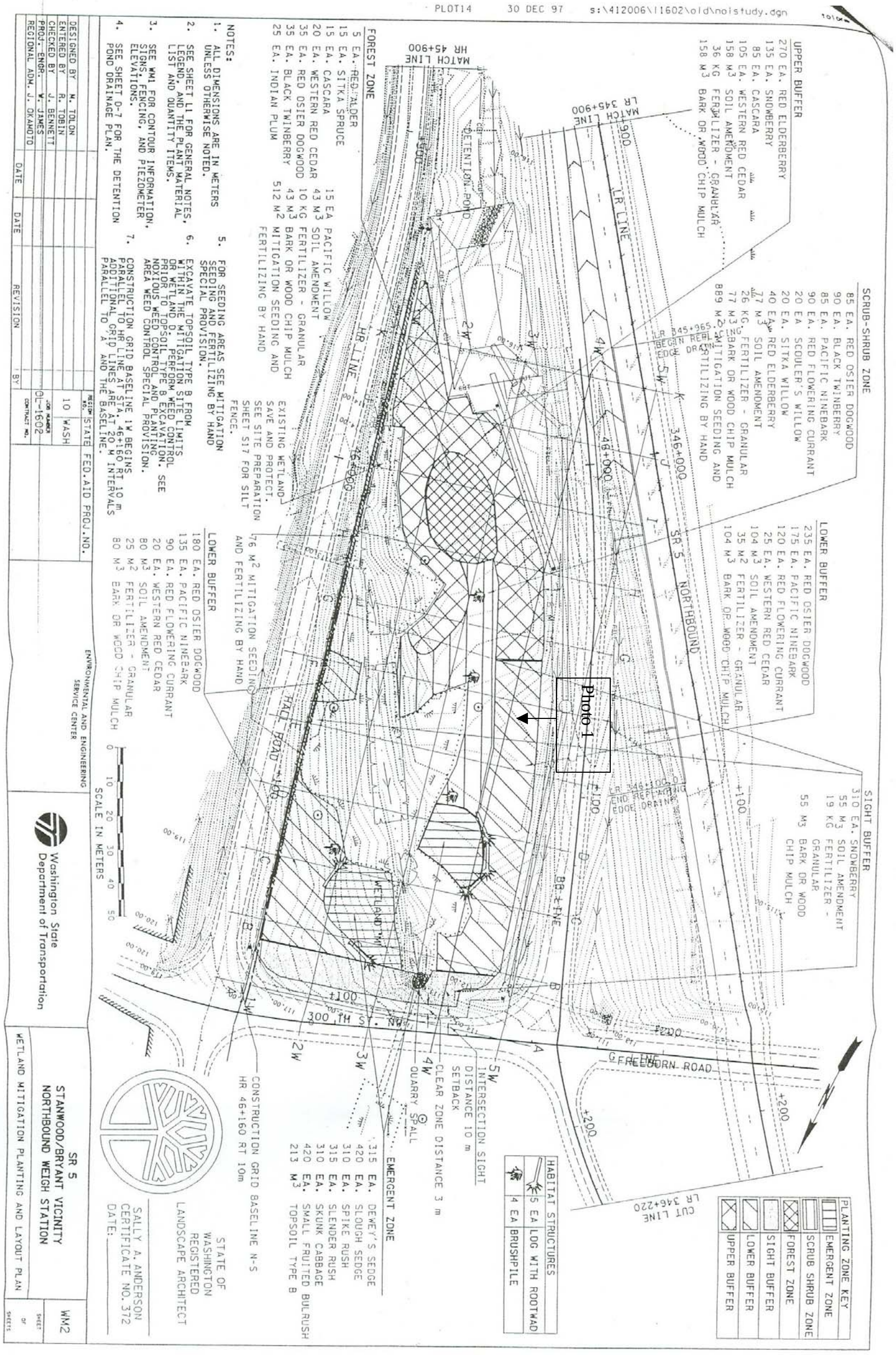
Table 3 Bird Species Observed On Site in 2005

FAMILY NAME	COMMON NAME	SCIENTIFIC NAME	STATUS[2]
Charadriidae	Killdeer	*Charadrius vociferus*	Wetland-associated
Picidae	Downy Woodpecker	*Picoides pubescens*	
Tyrannidae	Willow Flycatcher	*Empidonax traillii*	Wetland-associated
	Pacific-slope Flycatcher	*Empidonax difficilis*	
Corvidae	American Crow	*Corvus brachyrhynchos*	
Hirundinidae	Barn Swallow	*Hirundo rustica*	Wetland-associated
Paridae	Black-capped Chickadee	*Poecile atricapillus*	Wetland-associated
Turdidae	Swainson's Thrush	*Catharus ustulatus*	
	American Robin	*Turdus migratorius*	
Bombycillidae	Cedar Waxwing	*Bombycilla cedrorum*	
Parulidae	Yellow-rumped Warbler	*Dendroica petechia*	
	Common Yellowthroat	*Geothlypis trichas*	Wetland-dependant
Emberizidae	Dark-eyed Junco	*Junco hyemalis*	
	Song Sparrow	*Melospiza melodia*	
	White-crowned Sparrow	*Zonotrichia leucophrys*	
Fringillidae	American Goldfinch	*Carduelis tristis*	

[2] Birds are assigned a wetland-dependent and wetland associated status based on habitat preference and the classification scheme presented in Brown and Smith (1998). Regional variation occurs. References used to further classify species include Thomas (1979), Ehrlich et al. (1988), Smith et al. (1997), and other sources.

Appendix 4 – Planting Plan

(from Ehinger and Tolon 1997)



Literature Cited

1. Brown, S. C. and C. R. Smith. 1998. Breeding Season Bird Use of Recently Restored Versus Natural Wetlands in New York. Journal of Wildlife Management 62 (4): 1480-1491.

2. Ehinger, S. and Tolon, M. Washington State Department of Transportation. 1997. SR 5 Stanwood/Bryant Vicinity Weigh Station Conceptual Wetland Mitigation Plan. Seattle, WA.

3. Ehrlich, P. R., D. S. Dobkin, and D. Wheye. 1988. The Birder's Handbook. Simon and Schuster, Inc., NY.

4. Smith, M. R., P. W. Mattocks, Jr., and K. M. Cassidy. 1997. Breeding birds of Washington State. Volume 4 *in* Washington State Gap Analysis – Final Report (K. M. Cassidy, C. E. Grue, M. R. Smith, and K. M. Dvornich, eds.). Seattle Audubon Society Publications in Zoology No. 1, Seattle, WA.

5. Thomas, J. W. (tech. ed.). 1979. Wildlife Habitats in Managed Forests – the Blue Mountains of Oregon and Washington. USDA Forest Service, Agricultural Handbook No. 553.

6. United States Army Corps of Engineers. 1998. Department of the Army Nationwide Permit 98-4-00030. Seattle, WA.

7. Washington State Department of Transportation (WSDOT). 2005. WSDOT Wetland Mitigation Site Monitoring Methods (25 May 2005). http://www.wsdot.wa.gov/environment/biology/docs/MethodsWhitePaper052004.pdf